

What we claim is:

1. A method for realizing call route by employing route service devices, which is employed in next generation network with soft switch as core control device, comprising
5 the following steps of:

(a) when user route changes, a soft switch control device reporting the changed route information to a route service device of a father node, the information including user character information, user node information and route operation type;

10 (b) the route service device receiving the report looking up a record of a user to be registered in a route information database, and registering route record of the user in the route information database according to the reported information and the user record;

(c) the route service device finishing registration broadcasting changed route information to the father node when the route information of the user changes in the local node relative to the father node;

15 (d) the route service device receiving the broadcast registering and broadcasting the received route information according to the same method of the route service device receiving the report;

(e) when calling across domains, the soft switch control device which the calling belongs to initiating an inquiry to the route service device of father node;

20 (f) the route service device receiving inquiry request looking up the route information of a user to be looked up in the route information database, if obtaining an inquiring result that the user route or the user does not exist, performing step (h), otherwise, performing step (g);

(g) the route service device continuing to inquire the node in said route record, if 25 there is no route record, continuing to inquire the father node, and returning to step (f); and

(h) returning the inquiring result to the node initiating the inquiry, the node receiving

the result continuing to return the result to the node inquiring it, until returning to the soft switch control device which first initiates the inquiry.

2. The method of claim 1, wherein when performing registration in step (b), if the operation type of the report information corresponds to user moving in, when there is no route record of the user in the route information database, establish a new record, when the record information of the user is different from the report information, update the record in conformity with preset condition, otherwise, not perform the operation; if the operation type of the report information corresponds to user moving out, delete or update the route record of the user which has the same node information.

10 3. The method of claim 1, wherein said operation types have two kinds, which are addition and deletion; or have three kinds, which are addition, move-out and account-cancel, and said user character information includes information of specific domain.

15 4. The method of claim 1, wherein the user node in said step (a) is the type of soft switch control device, or the type of route service device.

5. The method of claim 1, wherein in said step (c), the route service device finishing the registration also broadcasts the route information to the designated brother node when the route information of the user in the local node changes relative to the designated brother node.

20 6. The method of claim 1, wherein said operation types have two kinds, which are addition and deletion, in said step (f), the route service device performing inquiry makes judgment according to the looking up result in the route information database by following logic:

25 if the looking up result is that there is no record of user to be inquired, for the node which is at the highest layer, obtaining the looking up result that there is no user, for the node which is not at the highest layer, continuing inquiry; and

if there is record of user to be inquired in the looking up result, obtaining the

inquiring result of the user route when the user node in the route record is the soft switch control device, while continuing inquiry when it is not soft switch control device.

7. The method of claim 1, wherein said operation types have three kinds: addition, move-out and account-cancel, in said step (f), the route service device performing inquiry makes judgment according to the looking up result in the route information database by the following logic:

If the looking up result is that there is no record of user to be inquired, for the node which is at the highest layer, obtaining the looking up result that there is no user, for the node which is not at the highest layer, continuing inquiry;

10 If the looking up result is that there is record of user to be inquired, identifying the operation type in the record:

when the operation type is addition, if the user node in the record is the type of soft switch control device, obtaining the looking up result of the user route, if the user node is the type of route service device, continuing inquiry;

15 when the operation type is move-out, if the node is at the highest layer, obtaining the looking up result that there is no user, if the node is not at the highest layer, continuing inquiry; and

when the operation type is account-cancel, obtaining the looking up result that there is no user.

20 8. A system for realizing the method of claim 1, which is employed in next generation network with soft switch as core control device, and includes several soft switch control devices with users, wherein, several route service devices are further included, each of said route service devices and each of said soft switch control device form a node of system, and the nodes are networked in a layered form, each sub-node has 25 at least a father node, and each father node has at least a sub-node, said soft switch control device is a node at the lowest layer, and said route service device should have a sub-node, in which:

said soft switch device reports changed route information to the route service device of father node when its user adding or moving out, and initiates a route inquiry to the route service device of father node when its user calls across domains; and

5 said route service device is for registering the reported information, and performing adding, deleting and updating of route record in a route information database, broadcasting changed route information to related node, performing inquiry after receiving the inquiry request, and returning inquiring result to the node initiating the inquiry.

9. The system of claim 8, wherein said route service device comprises a route 10 information database module, a route registration module, a route broadcast module and a route inquiry module, in which,

the route information database module is for storing the route record of user, inputting the user route record, and providing a interface for accessing the user record;

15 the route registration module is for receiving the route information reported or forwarded by the route broadcast module, looking up the record of user to be registered in the route information database, and registering the route record of the user in the database according to the reported information and the content of user record;

the route broadcast module is for receiving the broadcasted route information, and broadcasting the route information of the user to its father node or both to the father node 20 and designated brother node when the route information of the user in local node changes relative to the father node or the father node and the designated brother node; and

the route inquiry module is for receiving or sending inquiry request, looking up the record of the user to be inquired in the route information database, returning the inquiring result to the node requesting the inquiry after finding the route of the user, and 25 determining that there is no user or receiving the inquiring result from other nodes, otherwise, continuing inquiring the node in the route record, and if there is no route record, continuing inquiring its father node.

10. A route service device employed in next generation network, which comprises a route information database module, a route registration module, a route broadcast module and a route inquiry module, in which,

the route information database module is for storing route record of user, inputting

5 the user route record, and providing a interface for accessing the user record;

the route registration module is for receiving the route information reported or forwarded by the route broadcast module, looking up the record of user to be registered in the route information database, and registering the route record of the user in the database according to the reported information and the content of user record;

10 the route broadcast module is for receiving the broadcasted route information, and broadcasting the route information of the user to its father node when the route information of the user in local node changes relative to its father node; and

the route inquiry module is for receiving or sending inquiry request, looking up the record of the user to be inquired in the route information database, returning the inquiring

15 result to the node requesting the inquiry after finding the route of the user, and determining that there is no user or receiving the inquiring result from other nodes, otherwise, continuing inquiring the node in the route record, and if there is no route record, continuing inquiring its father node.

11. The route service device of claim 10, wherein said route registration module

20 comprises: a report information receiving unit, for receiving route information reported

by the soft switch control device, or forwarded by the route broadcast module; a

registration access unit, for looking up the route record of the user in the route

information database according to the information of the user to be registered in the

reported information; and a register judgment unit, for establishing a new record if there

25 is no route record of the user when the operation type corresponds to the user moving in, updating the record in the database in conformity with preset condition if the route record information of the user is different from the reported information, otherwise, not

performing operation, deleting or updating the route record of the user if the operation type of the report information corresponds to user moving out and the user node in the user record is same to the node in the reported information.

12. The route service device of claim 10, wherein said route broadcast module
5 comprises: a broadcast information receiving unit, for receiving the route information broadcasted by other nodes, forwarding the information to the route registration module; a broadcast judgment unit, for judging whether the route information of the user to be registered from its node to its father node changes, if yes, handing over the route information of the user to the route information broadcast unit; and a route information broadcast unit, for broadcasting the changed route information to the father node.
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13. The route service device of claim 10, wherein said route inquiry module
comprises: an inquiry interface unit, for receiving inquiring request from other nodes or sending inquiry request to other nodes, and returning the inquiring result of the module to the node requesting the inquiry or forwarding the inquiring result received from other
15 nodes; an inquiry access unit, for looking up in the route information database according to the character information of the user to be looked up in the inquiry request, and reporting the inquiring result to the inquiry judgment unit; and an inquiry judgment unit, for judging whether the inquiring result is that the user route does not exist or the user does not exist according to the looking up result, or it is necessary to send inquiry request
20 to related node, and to indicate the inquiry interface unit to perform corresponding operation.

14. The route service device of claim 10, wherein said route broadcast module
broadcasts the route information to designated brother node when the route information of the user in local node changes relative to the designated brother node.

25 15. The route service device of claim 10, wherein the operation types of said route record have two kinds: addition and deletion, said inquiry judgment unit makes judgment according to the looking up result in the route information database by the following

logic:

if the looking up result is that there is no record of the user to be looked up, for the node that is at the highest layer, determining that the user does not exist, if the node is not at the highest layer, continuing inquiry; and

- 5 if the looking up result is that there is record of user to be looked up, when the user node in the route record is the soft switch control device, obtaining the user route, when the user node is not soft switch device, continuing inquiring the user node in the record.

16. The route service device of claim 10, wherein the operation types of the route record have three kinds: addition, move-out and account-cancel, said inquiry judgment

- 10 unit makes judgment according to the looking up result in the route information database by the following logic:

if the looking up result is that there is no record of user to be looked up, for the node that is at the highest layer, determining that the user does not exist; if the node is not at the highest layer, continuing inquiry, or returning father node to the inquiry node as the next jump inquiry node, so as to instruct the inquiry node to perform route inquiry with the next jump inquiry node;

if the looking up result is that there is record of user to be looked up in the looking up result, discerning the operation type in the record again:

when the operation type is addition, for the user node in record being the soft switch control device, obtaining the user route; for the user node being the route service device, continuing inquiring the user node, or returning the user node to the inquiry node as the next jump inquiry node, so as to instruct the inquiry node to perform route inquiry with the next jump inquiry node;

when the operation type is move-out, for the node that is at the highest layer, determining that the user does not exist, for the node that is not at the highest layer, continuing inquiring its father node, or returning the father node to the inquiry node as the next jump inquiry node, so as to instruct the inquiry node to perform the route inquiry

with the next jump inquiry node; and

when the operation type is account-cancel, determining that the user does not exist.